

August 6, 2002

(AR-18J)

J. Fred Hill, Jr
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RE: Marathon Ashland Petroleum LLC
St. Paul Park Refinery
Request for PSD Applicability Determination
FCCU Air Grid Maintenance and Replacement Projects

On March 15, 2002, Marathon Ashland Petroleum LLC ("MAP") submitted to the United States Environmental Protection Agency, Region 5 ("EPA" or "we") a letter requesting applicability determinations under 40 C.F.R. Part 60 Subparts A and J - National Standards of Performance for Petroleum Refineries ("NSPS") and under the Federal Prevention of Significant Deterioration Rules, 40 C.F.R. § 52.21 ("PSD"). The letter requests EPA to determine whether the replacement of the air grid on the fluid catalytic cracking unit ("FCCU") catalyst regenerator at MAP's refinery in St. Paul Park, Minnesota triggers NSPS and PSD. This letter will address PSD for the replacement project. We will address NSPS in a separate letter.

In essence, MAP contends that the proposed FCCU air grid replacement project is a routine replacement and therefore by regulation it is excluded from PSD review (See 40 Code of Federal Regulations section 52.21(b)(2)(iii)). In summary, we have determined that the air grid replacement project does not constitute a routine replacement under PSD. As a nonroutine modification this change may be subject to PSD if it is also determined to be a major modification.

In the letter submitted to EPA on March 15, 2002, MAP states that during its fall 2002 full refinery shutdown and turnaround at its refinery in St. Paul Park, it is planning to replace the air grid on the FCCU catalyst regenerator. The letter provides the following description of the FCCU catalyst regenerator and the air grid:

"The function of [the catalyst regenerator] is to regenerate catalyst by combustion of the coke that accumulates on the catalyst in the FCCU riser/reactor. The catalyst regenerator requires a mechanically sound air grid to ensure

equal distribution of the air... In the absence of good air distribution, the catalyst regenerator is subject to afterburn and hotspots, which can result in accelerated deterioration of the catalyst particles and other mechanical components."

The letter goes on to describe the purpose of the project:

"The existing air grid at the MAP St. Paul Park refinery is of a design that has been prone to increased erosion and operating problems throughout the industry. This air grid is nearly thirty years old. It is subject to a highly destructive environment and is experiencing erosion, cracking, and plugging. Numerous repairs to the air grid have been made during the last half of its life. While still functional, it is estimated that more than half of the air channels are in a condition that will warrant repair during the 2002 turnaround. These repairs are expected to take twenty maintenance days to complete, at a cost of more than \$0.5 million."

"As an alternative to repairing individual air channels within the air grid, the air grid can be replaced in its entirety. The new air grid would incorporate an abrasion-resistant lining and other minor design revisions that have proven to result in increased reliability and lower maintenance cost. This alternative can be completed within fifteen maintenance days, which is a significant advantage to the refinery. Replacement is expected to cost approximately \$0.5 million and, when projected savings in maintenance costs are taken into account, represents a cost savings relative to the repair alternative...."

The letter then describes the project's potential impact on emissions:

"MAP has taken action to ensure that the replacement air grid will minimize the effect on the operation of the FCCU catalyst regenerator in terms of pressure, superficial velocity, air rate, or oxygen concentration. Thus, except for the avoided NOx emission increases associated with hot spots in the regenerator, the proposed replacement will not have any impact on emissions."

On May 18, 2002, MAP submitted a letter providing additional information about the air grid project. In this letter, MAP provides technical details about the differences between the existing air grid and the proposed air grid. In addition to a table highlighting performance specifications of the new and

existing air grid, MAP provides the following description of the differences:

"The proposed air grid will contain dual diameter jets and will be designed for a pressure drop of 1.04 psi and a jet velocity of 189 feet per second. These operating targets will require a larger main distributor arm and fewer overall jets. Although the jet density will decrease from 3.3 jets/ft² to 2.2 jets/ft², the higher pressure drop and improved mechanical design should allow for better overall air distribution in the regenerator. A potential drawback from this design is that the FCCU will have to operate with a 0.50 psi higher pressure drop across the air grid. The Regenerator coke burn-off rate is anticipated to remain the same since the higher head pressure can be achieved on the existing blower curve."

Again, MAP discusses the project's potential impacts, including on emissions:

"The new air grid should result in reduced maintenance costs, increased reliability, and better air distribution in the Regenerator. These benefits could actually decrease the oxide of nitrogen emissions while keeping the other pollutant emissions constant due to the expected lower afterburn and CO promoter usage in the Regenerator."

In the May 18, 2002, letter, MAP also provides a revised cost estimate for the replacement project of \$1 million.

To trigger PSD at an existing source, the air pollution source that is modified must be "major", and the net emissions increase of any regulated pollutant emitted by the source, as a result of the modification, must be "significant". The first step to determine whether the source is major is to define the source and determine its emissions. Next, the source's potential emissions are compared to the appropriate major source threshold. Major source thresholds are defined in terms of annual emissions or tons per year. For PSD the major source threshold is generally 250 tons per year, but the PSD major source threshold is 100 tons per year if the stationary source belongs to a list of 28 source categories (See 40 CFR 52.21(b)(1)(i)(a)). Petroleum refineries, such as MAP, are identified as one of these 28 industrial categories. The St. Paul Park MAP facility emits more than 100 tons per year of air pollutants subject to regulation under the Clean Air Act and therefore is a major source.

As a major source under PSD, the next step in the applicability process is to determine whether the replacement project will

constitute a major modification. Major modification is defined in 40 CFR 52.21(b)(2)(i) to mean *any physical change in or change in the method of operation of a major stationary source that would result in a significant net emissions increase of any pollutant subject to regulation under the Act.* This involves comparing recent pre-change, or "baseline", actual emissions to the future potential emissions following the change. As stated in the September 18, 1989, memorandum from John Calcagni to William B. Hathaway, the comparison of prior "actual" to future "potential" emissions is made on a unit-by-unit basis for all emissions units at the source that will be affected by the change. It is done for the emission unit(s) undergoing the physical change or change in the method of operation and also for any other units at which normal operations could be affected by the change at the source.

More specifically, this involves a review for possible emissions increases and decreases at process-related emissions units upstream and downstream from the modified or new unit, even though the original design or permitted capacity may not have changed, but the present effective capacity of the process on a "historical actual-to-future potential to emit (PTE)" has changed as a result of the modification. Thus, if the modification allows the facility to operate at higher production rates than the baseline pre-modification levels, the potential increase(s) in emissions associated with the increased production from all units involved in the process must also be factored in to determine whether the modification triggers PSD applicability.

Once all emission increases and decreases are calculated for all regulated pollutants, a comparison is made to determine if the net increases exceed the significance thresholds associated with these pollutants. These regulated pollutants and their respective thresholds include, but are not limited to, carbon monoxide: 100 tons per year (tpy), nitrogen oxides: 40 tpy, sulfur dioxide: 40 tpy, particulate matter: 25 tpy; Particulate matter less than 10 microns: 15 tpy, and ozone: 40 tpy of volatile organic compounds (see 40 CFR 52.21(b)(23(i))).

We have determined that the air grid replacement project will constitute a modification, as it is a physical change, and may trigger PSD if it also results in a significant net emissions increase. This is based as well on the finding that none of the seven exemptions in 40 C.F.R. § 52.21(2)(iii) apply to the FCCU air grid replacement project. Each exemption is discussed below:

40 C.F.R. § 52.21(b)(2)(iii) states that:

A physical change or change in the method of operation shall not include:

(a) Routine maintenance, repair, and replacement;

EPA makes a case-by-case determination of whether a proposed physical change or change in method of operation at an existing facility is routine. In doing so we weigh the nature, extent, purpose, frequency, and cost of the work as well as other relevant factors to arrive at a common-sense finding. EPA's policy on routine maintenance, repair, and replacement is outlined in a series of applicability determinations concerning the rehabilitation of five utility boilers at Wisconsin Electric Power Company's ("WEPCO") Port Washington facility. This determination is in accordance with policy established in the WEPCO determination.

EPA has determined that the FCCU air grid replacement project is not routine, and therefore this exemption does not apply. The WEPCO determination defines a routine maintenance, repair, and replacement project as one that is "a regular, customary or standard undertaking for the purposes of maintaining the plant in its present condition." In the March 15, 2002, letter MAP indicates that the current air grid has been in operation for nearly 30 years. Clearly, a project conducted once every 30 years is far from a regular, customary or standard undertaking. In addition, the May 18, 2002, letter highlights a number of major differences between the new proposed air grid and the existing air grid, including a significant decrease in the jet density and a higher pressure drop. It is apparent from these differences that the purpose of this project is not to maintain the plant in its present condition, but to change it from its present condition.

(b) Use of an alternative fuel or raw material by reason of an order under sections 2 (a) and (b) of the Energy Supply and Environmental Coordination Act of 1974 (or any superseding legislation) or by reason of a natural gas curtailment plant pursuant to the Federal Power Act;

This project is the physical replacement of a component, not a change in the use of an alternative fuel or raw material. Therefore, this exemption does not apply.

(c) Use of an alternative fuel by reason of an order or rule under section 125 of the Act;

This project is the physical replacement of a component, not a change in the use of an alternative fuel. Therefore, this exemption does not apply.

(d) Use of an alternative fuel at a steam generating unit to the extent that the fuel is generated from municipal solid waste;

This project is the physical replacement of a component, not a change in the use of an alternative fuel. Therefore, this exemption does not apply.

(e) Use of an alternative fuel or raw material by a stationary source which: (1) The source was capable of accommodating before January 6, 1975, unless such change would be prohibited under any federally enforceable permit condition which was established after January 6, 1975, pursuant to 40 CFR 52.21 or under regulations approved pursuant to 40 CFR subpart I or 40 CFR 51.1666; or

This project is the physical replacement of a component, not a change in alternative fuel or raw material. Therefore, this exemption does not apply.

(f) An increase in the hours of operation or in the production rate, unless such change would be prohibited under any federally enforceable permit condition which was established after January 6, 1975, pursuant to 40 CFR 52.21 or under regulations approved pursuant to 40 CFR subpart I or 40 CFR 51.166.

This project is the physical replacement of a component, not an increase in the hours of operation. In addition, in the March 15, 2002 letter, MAP indicates that this project will not result in an increase in the production rate. As a result, this exemption does not apply to the air grid project.

(g) Any change in ownership at a stationary source.

This project is not a change in ownership. Therefore this exemption does not apply.

If the FCCU air grid replacement project is determined to be a major modification because the net emissions will increase above the significance levels, MAP can still avoid the PSD process by obtaining a "synthetic minor" permit. Under a synthetic minor permit the potential emission increases associated with the proposed change would be restricted by enforceable emission limits that would prevent it from exceeding the applicable PSD significance thresholds. In addition to emission limits, a synthetic minor permit would include other interrelated conditions consisting of operational or production limits, and

compliance monitoring methods such as testing, parametric monitoring, recordkeeping, and reporting requirements that would provide demonstration of continual compliance by the affected emission units with the applicable synthetic minor limits. Synthetic minor limits must be determined separately for any pollutant regulated by PSD and only for those that will exceed the major significance thresholds.

It should be noted that on March 15, 2002, MAP submitted an additional PSD/NSPS applicability determination request for a FCCU catalyst stripper replacement project. On May 18, 2002, MAP submitted a letter withdrawing their request and stating that the FCCU catalyst stripper project for the Fall 2002 turnaround had been cancelled.

If you have any questions regarding this PSD determination please call Bryan K. Holtrop of my staff, at (312) 886-6204.

Sincerely yours,

/s/

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